

[4910-13-U]

## DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39 [66 FR 13418 3/6/2001]

[Docket No. 2000-NE-38-AD; Amendment 39-12136; AD 2001-04-16]

RIN 2120-AA64

### **Airworthiness Directives; General Electric Company CF6-50 Series Turbofan Engines**

**AGENCY:** Federal Aviation Administration, DOT.

**ACTION:** Final rule; request for comments.

**SUMMARY:** This amendment supersedes an existing airworthiness directive (AD), applicable to General Electric Company (GE) CF6-50 series turbofan engines. That AD currently requires visual inspection of the stage 2 low pressure turbine (LPT) nozzle lock assemblies, and replacement of the borescope plug with a new design plug.

This amendment is prompted by a report of an uncontained engine failure on an engine that had complied with the current AD. This amendment requires additional inspections and provides interim and terminating corrective actions. The actions specified in this AD are intended to detect cracked, loose or missing stage 2 LPT nozzle lock assembly studs that could lead to failure of the locks, nozzle segment rotation, LPT case machining, and subsequent uncontained failure of the engine. The actions also provide for modifications of nozzle lock assemblies if the nozzle lock studs are found cracked, loose, or missing.

**DATES:** Effective March 21, 2001. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of March 21, 2001.

Comments for inclusion in the Rules Docket must be received on or before May 7, 2001.

**ADDRESSES:** Submit comments in triplicate to the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, Attention: Rules Docket No. 2000-NE-38-AD, 12 New England Executive Park, Burlington, MA 01803-5299. Comments may also be sent via the Internet using the following address: "9-ane-adcomment@faa.gov." Comments sent via the Internet must contain the docket number in the subject line. The service information referenced in this AD may be obtained from General Electric Company via Lockheed Martin Technology Services, 10525 Chester Road, Suite C, Cincinnati, Ohio 45215, telephone (513) 672-8400, fax (513) 672-8422. This information may be examined at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

**FOR FURTHER INFORMATION CONTACT:** Karen Curtis, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone: 781-238-7192, fax: 781-238-7199.

**SUPPLEMENTARY INFORMATION:** On September 21, 2000, the FAA issued AD 2000-20-02, Amendment 39-11913 (65 FR 58645, October 2, 2000) to require visual inspection of the stage 2 LPT nozzle lock studs, and replacement of the borescope plug with a new design plug. That action was prompted by three uncontained engine failures resulting from stage 2 LPT lock stud failures, nozzle segment rotation, and LPT case machining. That condition, if not corrected, could result in failure of the stage 2 LPT nozzle lock assemblies. Since AD 2000-20-02 was issued, there has been one more uncontained engine failure, on February 4, 2001, that has been attributed to the failure of

stage 2 Waspalloy LPT nozzle lock assembly studs. That engine is reported to have been in compliance with AD 2000-20-02, at the time of failure. Because of this report, and because of the recent issuance of three GE service bulletins (SB's), two of which are alert service bulletins (ASB's), the FAA has determined that it is necessary to supersede AD 2000-20-02. The GE SB's provide for:

- Stage 2 Waspalloy LPT nozzle lock ultrasonic inspection (previously allowed as an alternative method of compliance (AMOC) to AD 2000-20-02),
- LPT case modification and new nozzle lock incorporation (previously allowed as an AMOC to AD 2000-20-02), and,
- Stage 2 LPT additional nozzle lock incorporation.

The methods for complying with AD 2000-20-02 that were previously approved as AMOCS to that AD have been incorporated into this AD.

This AD incorporates by reference, one SB and one ASB as-written. This AD also incorporates by reference another inspection ASB, but with two exceptions. Because of the recent engine failure, the inspection ASB is incorporated with a reduction in the stage 2 LPT Waspalloy nozzle lock ultrasonic inspection thresholds, but does not include the requirement to inspect the stages 3 and 4 LPT nozzle locks.

#### **Manufacturer's Service Information**

The FAA has reviewed and approved the technical contents of the following:

- GE ASB CF6-50 72-A1197, dated December 14, 2000, that describes procedures for on-wing or off-wing initial and repetitive ultrasonic inspections of stage 2 LPT Waspalloy nozzle lock studs for cracks. This ASB also defines initial and repetitive visual inspections of stage 2 LPT Rene nozzle lock studs.
- GE ASB CF6-50 72-A1201, dated December 22, 2000, and CF6-50 72-A1201, Revision 1, dated February 6, 2001, describe procedures for LPT case modification and incorporation of new design nozzle locks. Accomplishment of this ASB constitutes terminating action for the inspection requirements of this AD.
- GE SB CF6-50 72-1203, dated November 22, 2000, and CF6-50 72-1203 Revision 1, dated February 7, 2001, describe procedures for incorporating additional stage 2 LPT nozzle locks when an engine is found to have a reject condition as described in GE ASB CF6-50 72-A1197, dated December 14, 2000, and the required compliance cannot be addressed by an immediate shop visit.

#### **Differences Between the Manufacturer's Service Information and This AD**

Although GE ASB CF6-50 72-A1197, dated December 14, 2000, requires ultrasonic inspections of stage 2 LPT Waspalloy nozzle lock studs to be done at specified times, the FAA has determined that more stringent initial and repetitive ultrasonic inspection time intervals are required to meet the necessary level of safety, and have incorporated those intervals in this amendment. Also, although that ASB requires the stages 3 and 4 LPT nozzle locks to be inspected, the FAA has determined that an unsafe condition is not likely to occur as a result of a stage 3 or 4 lock stud failure and therefore this AD requires only the stage 2 LPT nozzle locks to be inspected.

#### **Actions Required by this AD**

Since an unsafe condition has been identified that is likely to exist or develop on other GE CF6-50 series turbofan engines of the same type design, this AD supersedes AD 2000-20-02 to require:

- Installation of the solid borescope plug for engines that have not already complied with paragraph (e) of AD 2000-20-02.
- On-wing or off-wing initial and repetitive ultrasonic inspections of stage 2 Waspalloy LPT nozzle lock assembly studs for cracks.
- On-wing or off-wing initial and repetitive visual inspections of stage 2 LPT nozzle lock assembly studs for loose or missing studs.
- Replacement of all of the stage 2 LPT lock assemblies with new design assemblies before further flight if a cracked, loose, or missing stud is found, OR,
- Incorporation of additional stage 2 LPT nozzle locks if no indications of nozzle rotation are found, as an interim action to allow time to arrange for a shop visit, within 3,500 cycles-in-service.

- Inspection of the area surrounding the borescope plug for evidence of buckling or cracks whenever the nozzle lock studs are inspected.
- Inspection for loose or missing added nozzle locks and LPT case cracking in the areas of the added nozzle locks, every 750 hours time-in-service.
- Replacement of the LPT lock assemblies with new design assemblies before further flight if any LPT case buckling or cracks are found, or if nozzle segment rotation is found.

#### **Immediate Adoption of This AD**

Since a situation exists that requires the immediate adoption of this regulation, it is found that notice and opportunity for prior public comment hereon are impracticable, and that good cause exists for making this amendment effective in less than 30 days.

#### **Comments Received**

Interested persons were afforded an opportunity to participate in the making of Amendment 39-11913. Due consideration has been given to the comments received.

#### **Change Inspection Thresholds and Intervals**

One commenter requests that the inspection thresholds and intervals be changed to coincide with scheduled aircraft “A-Check” intervals, or the manufacturer’s recommended engine repetitive maintenance intervals.

The FAA disagrees. As the commenter stated in their request, the “A-Check” interval can vary from operator to operator. “A-Check” intervals as low as 200 hours to as high as 700 hours have been reported. To provide an equivalent level of safety for all operators, the inspection thresholds and intervals must therefore be defined in this AD.

#### **Extend 30 Day Compliance Requirement for Borescope Plug Replacement**

One commenter requests that the 30 day compliance requirement for the borescope plug installation be extended to 90 days or next “A-Check”, due to limited parts availability.

The FAA disagrees. The manufacturer provided evidence that sufficient parts had been procured and distributed to support the 30 day requirement.

#### **Editorial Correction**

One commenter requests that the word “place” in paragraph (d) of AD 2000-20-02 be changed to read “replace”.

The FAA agrees. A correction was published in the **Federal Register** on October 16, 2000 (65 FR 61216).

#### **Comments on New Amendment Invited**

Although this superseding amendment is in the form of a final rule that involves requirements affecting flight safety and, thus, was not preceded by notice and an opportunity for public comment, comments are invited on this rule. Interested persons are invited to comment on this rule by submitting such written data, views, or arguments as they may desire. Communications should identify the Rules Docket number and be submitted in triplicate to the address specified under the caption “ADDRESSES.” All communications received on or before the closing date for comments will be considered, and this rule may be amended in light of the comments received. Factual information that supports the commenter's ideas and suggestions is extremely helpful in evaluating the effectiveness of the AD action and determining whether additional rulemaking action would be needed.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest a need to modify the rule. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report that summarizes each FAA-public contact concerned with the substance of this AD will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this rule must submit a self-addressed, stamped postcard on which the following statement is made: “Comments to Docket Number 2000-NE-38-AD.” The postcard will be date stamped and returned to the commenter.

## **Regulatory Impact**

This final rule does not have federalism implications, as defined in Executive Order No. 13132, because it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Accordingly, the FAA has not consulted with state authorities prior to publication of this rule.

The FAA has determined that this regulation is an emergency regulation that must be issued immediately to correct an unsafe condition in aircraft, and is not a “significant regulatory action” under Executive Order 12866. It has been determined further that this action involves an emergency regulation under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). If it is determined that this emergency regulation otherwise would be significant under DOT Regulatory Policies and Procedures, a final regulatory evaluation will be prepared and placed in the Rules Docket. A copy of it, if filed, may be obtained from the Rules Docket at the location provided under the caption “ADDRESSES.”

## **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

## **Adoption of the Amendment**

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of Title 14 of the Code of Federal Regulations (14 CFR part 39) as follows:

## **PART 39 - AIRWORTHINESS DIRECTIVES**

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

### **§39.13 [Amended]**

2. Section 39.13 is amended by removing Amendment 39-11913 (65 FR 58645, October 2, 2000), and by adding a new airworthiness directive (AD), Amendment 39-12136, to read as follows:

# AIRWORTHINESS DIRECTIVE



Aircraft Certification Service  
Washington, DC

U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

*We post ADs on the internet at "av-info.faa.gov"*

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

**2001-04-16 General Electric Company:** Amendment 39-12136. Docket No. 2000-NE-38-AD. Supersedes AD 2000-20-02, Amendment 39-11913.

## Applicability

This airworthiness directive (AD) is applicable to General Electric Company (GE) CF6-50 series turbofan engines. These engines are installed on, but not limited to, Airbus Industries A300, Boeing Airplane Company 747, and McDonnell Douglas Corporation DC10 airplanes.

**Note 1:** This AD applies to each engine identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For engines that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (l) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

## Compliance

Compliance with this AD is required as indicated, unless already done.

To detect cracked, loose, or missing stage 2 low pressure turbine (LPT) nozzle lock assembly studs that could lead to failure of the locks, segment rotation, LPT case machining, and subsequent uncontained failure of the engine, do the following:

## Installation of Solid Borescope Plug

(a) For engines that have not already complied with paragraph (e) of AD 2000-20-02, install a stage 2 LPT solid borescope inspection plug part number (P/N) 2083M99P01, or a plug with the alternate P/N's 305-381-303-0 or 2110M79P01, before further flight, unless paragraph (e)(1) (GE Alert Service Bulletin (ASB) CF6-50 72-A1201, or CF6-50 72-A1201, Revision 1) of this AD has already been accomplished.

## Visual Inspection of Stage 2 Nozzle Lock Assemblies

(b) For engines with stage 2 LPT Rene 41 nozzle lock assemblies, visually inspect locks for loose or missing studs, in accordance with Paragraph 3.B., Accomplishment Instructions of GE ASB CF6-50 72-A1197, dated December 14, 2000, within the following times:

**Table 1. Rene 41 Stage 2 Nozzle Lock Assemblies**

<b>Time On Rene 41 Lock Assembly</b>	<b>Inspect Within</b>	<b>Repetitive Inspect Within</b>
(1) Less than 4,000 hours time-since-new (TSN) on the effective date of this AD.	750 hours after accumulating 4,000 hours TSN.	750 hours time-since-last inspection (TSLI).
(2) 4,000 hours TSN or greater, or if TSN is not known, on the effective date of this AD.	750 hours TIS after the effective date of this AD.	750 hours TSLI.

(c) For engines with stage 2 LPT Waspalloy nozzle lock assemblies, visually inspect for loose or missing studs within the following times:

**Table 2. Waspalloy Stage 2 Nozzle Lock Assemblies**

<b>Time On Stage 2 Waspalloy Lock Assembly</b>	<b>Initial Inspect Within</b>	<b>Repetitive Inspect Within</b>
(1) Less than 1,250 hours TSN on the effective date of this AD.	750 hours after accumulating 1,250 hours TSN.	750 hours TSLI.
(2) Greater than or equal to 1,250 hours TSN, but less than 4,000 hours TSN on the effective date of this AD.	750 hours TIS after the effective date of this AD.	750 hours TSLI.
(3) 4,000 hours TSN or greater, on the effective date of this AD, or, if hours unknown.	250 hours TIS after the effective date of this AD.	750 hours TSLI.

### **Ultrasonic Inspection of Stage 2 LPT Waspalloy Nozzle Lock Assemblies**

(d) For engines with stage 2 LPT Waspalloy nozzle lock assemblies with no loose or missing studs found in accordance with paragraph (c) of this AD, ultrasonically inspect studs for cracks in accordance with Paragraph 3.A., Accomplishment Instructions of GE ASB CF6-50 72-A1197, dated December 14, 2000, within the times identified in paragraph (c) of this AD.

### **Corrective Action**

(e) For engines with either stage 2 LPT Rene 41 or Waspalloy nozzle lock assemblies where the assembly studs are found loose or missing, do one of the following:

(1) Prior to further flight, modify the LPT case and install new design nozzle locks as specified in GE ASB CF6-50 72-A1201, dated December 22, 2000, or CF6-50 72-A1201, Revision 1, dated February 6, 2001.

OR,

(2) Prior to further flight, as an interim on-wing action for stage 2 LPT nozzle locks only, modify the LPT case and install seven additional nozzle locks as specified in GE service bulletin CF6-50 72-1203, dated November 22, 2000, or CF6-50 72-1203, Revision 1, dated February 7, 2001, providing the following conditions are met prior to modification:

- (i) There are no cracks or distortion in the stage 2 borescope plug area of the LPT case.
- (ii) The borescope plug is able to be removed.

(iii) There is no evidence of stage 2 nozzle segment rotation, as evidenced by a borescope inspection that reveals that no nozzle segment circumferential gap is greater than 0.250 inch.

(f) For engines with stage 2 LPT nozzle lock assemblies modified in accordance with paragraph (e)(2) of this AD, perform the following inspections every 750 hours TIS, until the engine is modified in accordance with paragraph (e)(1) of this AD:

- (1) Repetitive visual inspections of the seven additional nozzle locks for loose or missing locks.
- (2) Repetitive visual inspections of the LPT case in the area of the additional locks for cracks.
- (3) Repetitive visual inspections of the LPT case in the area of the borescope plug for cracks.

**Note 2:** Modification of the LPT case and installation of the additional locks per paragraph (e)(2) of this AD should not be performed by the same individual for all engines installed on the same airplane prior to the same flight.

(g) Engines rejected by the inspections in paragraph (f) of this AD are not serviceable and must be modified in accordance with paragraph (e)(1) of this AD prior to further flight.

(h) Modification of the LPT case in accordance with paragraph (e)(2) of this AD establishes a life limit for LPT case P/N's 2083M38G01, 2083M38G02, 2083M38G03, 2083M38G04, 2083M38G05, 2083M38G06, 2083M38G07, and 2083M38G08, of 3,500 CIS since modification.

(i) Except as required in paragraph (j) of this AD, for engines with stage 2 LPT Waspalloy nozzle lock assemblies where one or more studs are found cracked by the inspections in paragraph (d) of this AD, but where no two cracked studs are located adjacent to each other, continued operation for an additional 25 hours time-in-service, maximum, is allowed prior to performing one of the corrective actions in paragraph (e) of this AD.

(j) For engines with two or more adjacent stage 2 LPT Waspalloy nozzle lock studs found cracked by the inspections in paragraph (d) of this AD, do one of the corrective actions in paragraph (e) of this AD prior to further flight.

**Note 3:** After installation of new design nozzle locks in accordance with paragraph (e)(1) of this AD, any solid borescope plug may be replaced with the standard borescope plug if the operator so chooses.

### **Terminating Action**

(k) Accomplishment of Paragraphs 3.A. through 3.E(2) of GE ASB CF6-50 72-A1201, dated December 22, 2000, or CF6-50 72-A1201, Revision 1, dated February 6, 2001 (modification of the LPT case and installation of new design nozzle locks per paragraph (e)(1) of this AD), is terminating action for the inspection requirements of this AD.

### **Alternative Methods of Inspection**

(l) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Engine Certification Office (ECO). Operators shall submit their requests through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, ECO.

**Note 4:** Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the ECO.

### **Special Flight Permits**

(m) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the aircraft to a location where the requirements of this AD can be accomplished.

### **Incorporation by Reference Material**

(n) The actions required by this AD shall be done in accordance with the following General Electric Co. alert service bulletins and service bulletin:

<b>Document</b>	<b>Pages</b>	<b>Revision</b>	<b>Date</b>
CF6-50 72-A1197	1-28	Original	December 14, 2000
Total pages: 28			
CF6-50 72-A1201	1-21	Original	December 22, 2000
Total pages: 21			
CF6-50 72-A1201	1-22	1	February 6, 2001
Total pages: 22			
CF6-50 72-1203	1-9	Original	November 22, 2000
Total pages: 9			
CF6-50 72-1203	1-12	1	February 7, 2001
Total pages: 12			

The incorporations by reference were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from General Electric Company via Lockheed Martin Technology Services, 10525 Chester Road, Suite C, Cincinnati, Ohio 45215, telephone (513) 672-8400, fax (513) 672-8422. Copies may be inspected at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW, suite 700, Washington, DC.

### **Effective Date**

(o) This amendment becomes effective on March 21, 2001.

**FOR FURTHER INFORMATION CONTACT:** Karen Curtis, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone: 781-238-7192, fax: 781-238-7199.

Issued in Burlington, Massachusetts, on February 23, 2001.

Jay J. Pardee, Manager, Engine and Propeller Directorate, Aircraft Certification Service.